WHAT IS CLAIMED IS:

1. An isolated nucleic acid which encodes a human SH3D1A, including analogs, fragments, variants, and mutants, thereof.

2. The isolated nucleic acid of claim 1, wherein the nucleic acid has a nucleotide sequence having at least 85% similarity with the nucleic acid coding sequence of SEQ ID NO: 1, or that of Figures 8, 10, 12 or 14.

3. The isolated nucleic acid of claim 1, wherein the nucleic acid is DNA or RNA

4. The isolated nucleic acid of claim 2, wherein the nucleic acid is cDNA or genomic DNA.

5. The isolated nucleic acid of claim 1, wherein the nucleic acid encodes an amino acid sequence which forms two EH domains and four SH3 domains.

6. The isolated nucleic acid of claim 4, wherein the nucleic acid encodes an amino acid sequence which forms one or more myristoylation sites in the EH domains and SH3 domains.

7. The isolated nucleic acid of claim 4, wherein the nucleic acid encodes an amino acid sequence of the EH1 domain which corresponds to the region from about amino acid sequence 15 to about sequence 102 of Figure 5.

8. The isolated nucleic acid of claim 4, wherein the nucleic acid encodes an amino acid sequence of the EH2 domain which corresponds to the region from about 215 to about sequence 310 of Figure 5.

9. The isolated nucleic acid of claim 4, wherein the nucleic acid encodes an amino acid sequence of the SH3-1 domain which corresponds to the region from about

sequence 740 to about sequence 800 of Figure 5.

10. The isolated nucleic acid of claim 4, wherein the nucleic acid encodes an amino acid sequence of the SH3-2 domain which corresponds to the region from about sequence 908 to about sequence 966 of Figure 5.

11. The isolated nucleic acid of claim 4, wherein the nucleic acid encodes an amino acid sequence of the SH3-3 domain which corresponds to the region from about sequence 999 to about sequence 1062 of Figure 5.

12. The isolated nucleic acid of claim 4, wherein the nucleic acid encodes an amino acid sequence of the SH3-4 domain which corresponds to the region from about sequence 1080 to about sequence 1138 of Figure 5.

13. The isolated nucleic acid of claim 4, wherein the nucleic acid encodes an amino acid sequence of the SH3-1 domain which corresponds to the region from about sequence 740 to about sequence 800 of Figure 5.

14. The isolated nucleic acid of claim 1, wherein the nucleic acid encodes an amino acid sequence as set forth in Figures 5, 9, 11, 13 or 15 .

15. The isolated nucleic acid of claim 1, wherein the nucleic acid is labeled with a detectable marker.

16. The isolated nucleic acid of claim 15, wherein the detectable marker is a radioactive isotope, a fluorophor or an enzyme.

17. An oligonucleotide of at least 15 nucleotides capable of specifically hybridizing with a sequence of nucleotides present within a nucleic acid which encodes the human SH3D1A of claim 1.

18. The oligonucleotide of claim 17, wherein the nucleic acid is DNA or RNA.

19. The oligonucleotide of claim 17, wherein the oligonucleotide is labeled with a detectable marker.

20. The oligonucleotide of claim 19, wherein the oligonucleotide is a radioactive isotope, a fluorophor or an enzyme.

21. A nucleic acid having a sequence complementary to the sequence of the isolated nucleic acid of claim 1.

22. An antisense molecule capable of specifically hybridizing with the isolated nucleic acid of claim 1.

23. A vector comprising the isolated nucleic acid of claim 1.

24. The vector of claim 23, further comprising a promoter of RNA transcription operatively, or an expression element linked to the nucleic acid.

25. The vector of claim 23, wherein the promoter comprises a bacterial, yeast, insect or mammalian promoter.

26. The vector of claim 24, further comprising plasmid, cosmid, yeast artificial chromosome (YAC), BAC, P1, bacteriophage or eukaryotic viral DNA.

27. A host vector system for the production of a polypeptide which comprises the vector of claim 23 in a suitable host.

28. The host vector system of claim 27, wherein the suitable host is a prokaryotic or eukaryotic cell.

29. The host vector system of claim 28, wherein the eukaryotic cell is a yeast, insect, plant or mammalian cell.

30. A method for producing a polypeptide which comprises growing the host vector system of claim 23 under suitable conditions permitting production of the polypeptide and recovering the polypeptide so produced.

31. A method of obtaining a polypeptide in purified form which comprises:
(a) introducing the vector of claim 23 into a suitable host cell;
(b) culturing the resulting cell so as to produce the polypeptide;
(c) recovering the polypeptide produced in step (b); and
(d) purifying the polypeptide so recovered.

32. A polypeptide comprising the amino acid sequence of a human SH3D1A.

33. The polypeptide of claim 32, wherein the amino acid sequence is set forth in Figure 5.

34. A fusion protein or chimeric comprising the polypeptide of claim 32.

35. An antibody which specifically binds to the polypeptide of claim 33.

36. The antibody of claim 34, wherein the antibody is selected from a chimeric antibody, a monoclonal antibody, and a polyclonal antibody.

37. A method for determining whether a subject carries a mutation in the SH3D1A gene which comprises:
(a) obtaining an appropriate nucleic acid sample from the subject; and
(b) determining whether the nucleic acid sample from step (a) is, or is derived from, a nucleic acid which encodes mutant SH3D1A so as to thereby determine whether a subject carries a mutation in the SH3D1A gene.

38. The method of claim 36, wherein the nucleic acid sample in step (a) comprises mRNA corresponding to the transcript of DNA encoding a mutant SH3D1A, and wherein the determining of step (b) comprises:

(i) contacting the mRNA with the oligonucleotide of claim 17 under conditions permitting binding of the mRNA to the oligonucleotide so as to form a complex;

(ii) isolating the complex so formed; and

(iii) identifying the mRNA in the isolated complex so as to thereby determine whether the mRNA is, or is derived from, a nucleic acid which encodes mutant SH3D1A.

39. The method of claim 29, wherein the determining of step (b) comprises:

(i) contacting the nucleic acid sample of step (a), and the isolated nucleic acid of claim 1 with restriction enzymes under conditions permitting the digestion of the nucleic acid sample, and the isolated nucleic acid into distinct, distinguishable pieces of nucleic acid;

(ii) isolating the pieces of nucleic acid; and

(iii) comparing the pieces of nucleic acid derived from the nucleic acid sample with the pieces of nucleic acid derived from the isolated nucleic acid so as to thereby determine whether the nucleic acid sample is, or is derived from, a nucleic acid which encodes mutant SH3D1A.

40. A method for determining whether a subject has a megakaryocytic abnormality, myeloproliferative disorder, platelet disorder, leukemia or neural disorder, which comprises:

(a) obtaining an appropriate sample from the subject; and

(b) contacting the sample with the antibody of claim 35 so as to thereby determine whether a subject has the megakaryocytic abnormality, myeloproliferative disorder, platelet disorder, leukemia or neural disorder.

41. A method for determining whether a subject has a predisposition for a megakaryocytic abnormality, hematopoetic disorders, myeloproliferative disorder, platelet disorder, leukemia or neural disorder, which comprises:

(a) obtaining an appropriate nucleic acid sample from the subject; and

(b) determining whether the nucleic acid sample from step (a) is, or is derived from, a nucleic acid which encodes SH3D1A so as to thereby determine whether a subject has a predisposition for a megakaryocytic abnormality, myeloproliferative disorder, platelet disorder, leukemia or neural disorder.

42. The method of claim 41, wherein the sample comprises blood, tissues or sera.

43. A method for determining whether a subject has a megakaryocytic abnormality, myeloproliferative disorder, platelet disorder, leukemia or neural disorder, which comprises:

(a) obtaining an appropriate nucleic acid sample from the subject; and

(b) determining whether the nucleic acid sample from step (a) is, or is derived from, a nucleic acid which encodes the human SH3D1A so as to thereby determine whether a subject has megakaryocytic abnormality, myeloproliferative disorder, platelet disorder, leukemia or neural disorder.

44. The method of ~~claim~~ 44, wherein the nucleic acid sample in step (a) comprises mRNA corresponding to the transcript of DNA encoding a human SH3D1A, and wherein the determining of step (b) comprises:

(i) contacting the mRNA with the oligonucleotide of claim 25 under conditions permitting binding of the mRNA to the oligonucleotide so as to form a complex;

(ii) isolating the complex so formed; and

(iii) identifying the mRNA in the isolated complex so as to thereby determine whether the mRNA is, or is derived from, a nucleic acid which encodes a human SH3D1A.

45. A method of suppressing cells unable to regulate themselves which comprises introducing a purified human SH3D1A into the cells in an amount effective to suppress the cells.

46. A method for screening a tumor sample from a human subject for a somatic alteration in a SH3D1A gene in said tumor which comprises gene comparing a first sequence selected form the group consisting of a SH3D1A gene from said tumor sample, SH3D1A RNA from said tumor sample and SH3D1A cDNA made from mRNA from said tumor sample with a second sequence selected from the group consisting of SH3D1A gene from a nontumor sample of said subject, SH3D1A RNA from said nontumor sample and SH3D1A cDNA made from mRNA from said nontumor sample, wherein a difference in the sequence of the SH3D1A gene, SH3D1A RNA or SH3D1A cDNA from said tumor sample from the sequence of the SH3D1A gene, SH3D1A RNA or SH3D1A cDNA from said nontumor sample indicates a somatic alteration in the SH3D1A gene in said tumor sample.

47. A method for screening a tumor sample from a human subject for the presence of a somatic alteration in a SH3D1A gene in said tumor which comprises comparing SH3D1A polypeptide from said tumor sample from said subject to SH3D1A polypeptide from a nontumor sample from said subject to analyze for a difference between the polypeptides, wherein said comparing is performed by (i) detecting either a full length polypeptide or a truncated polypeptide in each sample or (ii) contacting an antibody which specifically binds to either an epitope of an altered SH3D1A polypeptide or an epitope of a wild-type SH3D1A polypeptide to the SH3D1A polypeptide from each sample and detecting antibody binding, wherein a difference between the SH3D1A polypeptide from said tumor sample from the SH3D1A polypeptide from said nontumor sample indicates the presence of a somatic alteration in the SH3D1A gene in said tumor sample.

48. A method for identifying a chemical compound which is capable of suppressing cells unable to regulate themselves in a subject which comprises:

(a) contacting the SH3D1A with a chemical compound under conditions permitting binding between the SH3D1A and the chemical compound;

(b) detecting specific binding of the chemical compound to the SH3D1A; and

(c) determining whether the chemical compound inhibits the SH3D1A so as to identify a chemical compound which is capable of suppressing cells unable to regulate themselves.

49. A method for monitoring the progress and adequacy of treatment in a subject who has received treatment for a megakaryocytic abnormality, myeloproliferative disorder, platelet disorder, leukemia condition or neural disorder which comprises monitoring the level of nucleic acid encoding the human SH3D1A at various stages of treatment.

50. A method for monitoring the a prenatal for tumor risk progress or megakaryocytic abnormality, myeloproliferative disorder, hematopoetic disorder, platelet disorder, or leukemia which comprises monitoring the level of nucleic acid encoding the human SH3D1A.

51. A pharmaceutical composition comprising an amount of the polypeptide of claim 1 and a pharmaceutically effective carrier or diluent.

52. A method of treating a subject having megakaryocytic abnormality, myeloproliferative disorder, platelet disorder, leukemia or neural disorder which comprises introducing the isolated nucleic acid of claim 1 into the subject under conditions such that the nucleic acid expresses SH3D1A or its antisense nucleic acid, so as to thereby treat the subject.

53. The method of claim 52, wherein the subject is a prenatal.

54. A method of treating a subject having megakaryocytic abnormality, myeloproliferative disorder, hematopoietic disorder, platelet disorder, leukemia or neural disorder which comprises administration to the subject a therapeutically effective amount of the pharmaceutical composition of claim 51 to the subject.

55. The method of claim 54, wherein the subject is a prenatal.

56. The method of claim 52, wherein the administration comprises, topical, oral, aerosol, subcutaneous administration, infusion, intralesional, intramuscular, intraperitoneal, intratumoral, intratracheal, intravenous injection, or liposome-mediate delivery.

57. A transgenic, nonhuman mammal comprising the isolated nucleic acid of claim 1.